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NOTES FROM CLINICAL LECTURES DELIVERED DURING A TERM OF SERVICE AT THE PHILADELPHIA HOSPITAL.

By J. William White, M.D.,
One of the Surgeons to the Hospital; Professor of Clinical Surgery in the University of Pennsylvania.

presented by the author

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The following memoranda are excerpts from clinical lectures upon a number of cases on which I operated during my recent term of service at the above hospital. It did not seem worth while to publish the lectures entire, as they were delivered to medical students and not to physicians, and were of necessity more or less elementary. I have tried to select from them some points of possible interest to the practitioner who may contemplate operating on similar cases.

1. Hemorrhoids—Whitehead's Operation.—G. S., 43 years of age, seven months previous to admission had a severe attack of biliary colic terminating in a copious hemorrhage from the bowels. This was shortly followed by the development of a circular mass of hemorrhoids protruding from the anus at each stool, bleeding profusely and causing considerable pain and annoyance. The following operation was performed on October 31st:

The patient being etherized, and placed in the lithotomy position, the sphincters were paralyzed by digital stretching, the thumbs being introduced into the anus, back to back, and then carried forcibly towards the tuberosities of the ischium, the dilatation being thus made as complete as possible. The hemorrhoids with the whole area of mucous membrane giving rise to them, the so-called "pile area," were thus made to prolapse, after which the mucous membrane was completely divided just within its line of junction with the skin, the "white line" of Mr. Hilton. The membrane was then carefully separated from the external and internal sphincters by means of scissors aided by dissection with the fingers, the separation being effected close to the surface of the muscles. In this way the whole circle of mucous membrane bearing with it the hemorrhoidal tumors was freed from its

connections until it could be drawn down outside of the anus. It was then divided circularly just above the upper limit of the piles. This division was made by means of scissors, and in sections of about one-third of an inch, each portion so cut being immediately stitched to the free edge of the divided skin. It was begun at the posterior or lower margin of the anus so that the area of operation should be as little obscured by blood as possible. It was carried around the whole circumference of the bowel in this manner so that when the operation was complete not only the hemorrhoids, but also that portion of the mucous membrane of the lower part of the rectum in which they originate, were entirely removed. A circular wound was left, the free edges of the skin and mucous membrane being united by stitches as after circumcision. A few vessels required to be twisted and one or two ligatures were applied. Carbolated silk was used for the stitches. The wound was dusted with iodoform. A suppository of one-half grain of extract of opium was inserted into the rectum; a compress of salicylated absorbent cotton dusted with iodoform was placed against the anus and a T bandage was applied; the patient was kept in bed in a supine position; the bowels were confined by means of opium and concentrated diet for a week, after which a dose of castor oil was given. There was no fever and but little pain. Union by first intention followed through the whole wound. Most of the silk sutures were discharged at the time the bowels were opened and the patient's cure was complete in about twelve days.

Remarks.—Mr. Whitehead has now performed this operation more than 300 times, not only without a death but without abscess, incontinence of urine, stricture, or any alarming symptoms having occurred. It is claimed that the operation is not only less dangerous and less painful, but also much more thorough than the old operations by the ligature or by the clamp and cautery. It is thought that by removing all that portion of the mucous coat of the bowel in which the veins have become enlarged and weakened that the possibility of recurrence is done away with. On the other hand it is stated in favor of ligation that no blood whatever is lost, while hemorrhage seems more likely to occur after excision; that no fresh raw surface is exposed in a region which it is very difficult to keep aseptic; that the results are almost if not quite as good; and that the danger of subsequent stricture of the lower end of the rectum or anus is considerably less, at least in cases in which an entire ring of hemorrhoids is not ligated. Whitehead's operation may be said still to be on trial before the profession. I may add, however, that the only case of stricture at the anus which I have seen lately, resulting from an operation, followed the ligation of a hemorrhoidal mass which completely encircled the anus. As to statistics it is undoubted that there are occasional deaths from tetanus following the ligature of piles. I know of three unreported cases which have occurred in this city alone. It remains to be seen whether—as large numbers of practitioners adopt and perform the Whitehead operation—its statistics will remain as good as at present.

2. Amputation of Thigh. Consecutive Hemorrhage. Iodoform Tampon. Union by First Intention.—L. H., colored, 24 years of age, with a chronic suppurative tubercular arthritis of the left thigh, was taken before the class on January 5th. His general health was so poor that the knee-joint having been opened and very extensive bone disease having been discovered, it was thought best to proceed at once to amputation. This was done by antero-posterior musculo-cutaneous flaps at the middle of the thigh. The same night, at about midnight, I was called out to see him on account of a persistent hemorrhage which was taking place from the stump. It was opened, and the vessel, a large muscular branch, was found and tied. Long loose stitches were then passed through the

edges of the flaps and the ends twisted, after which the spaces between the flaps were filled with iodoform gauze packed in tightly so that all oozing was arrested. This was allowed to remain *in situ* for three days, when it was removed and the flaps closely approximated by means of the wire sutures. At the next dressing, a week later, union by first intention was found to have occurred through practically the entire wound.

Remarks.—Helferich, Senger, and Bramann, together with other surgeons, have recently employed the method above described, which they call the "secondary suture." Helferich gives four indications: the suspicion of tuberculosis in the wound; the existence of reasonable doubt as to perfect asepsis; the persistent oozing of blood; the communication of the wound with the intestinal or genito-urinary tract.

I have now used the method in a considerable number of cases.

In wounds where the bleeding cannot be entirely stopped the formation of a large clot is objectionable, not only on account of the pressure which it may make, as in fractures of the skull, but because of the risk of decomposition and blood poisoning. Although such clots may, through absorption and organization into connective tissue, aid in the process of repair, they sometimes remain fluid for long periods, and during that time are a source of danger. Therefore, when it is impossible to dry the wound absolutely, or where there is the least suspicion that it is not entirely aseptic, after thorough disinfection with 1–1000 bichloride solution and with an ethereal solution of iodoform applied to the wound by means of a syringe, it is loosely packed with strips of iodoform gauze of several feet in length, and three to four inches broad. They are applied so that the large part of each strip lies in the wound, and the ends come out at the angles. The tamponed wound is covered with sublimate gauze and cotton and an antiseptic bandage. If the secretions make their way through the dressings, the superficial layers are renewed, but the iodoform gauze is allowed to remain undisturbed for two days. If it is then removed by gentle traction on the ends hanging out of the wound, the latter is found clean, unirritated, not reddened, absolutely dry, and it is only very exceptionally that a ligature is required. Careful suturing, with or without drainage, has resulted in union by first intention, even in those cases in which, for any reason, as great weakness, or for the stoppage of bleeding from large vessels, the tampon has been left in from four to six days.

Two other amputations of the thigh were performed; one for a similar condition in the knee joint in a patient of advanced years, in whom excision on account of age and general weakness was not to be thought of, and the other a re-amputation. Both did equally well. In the latter case I was much interested in finding in the stump large irregular fragments of bone which were apparently reproduced from spiculæ or portions of bone-dust which had been left imbedded in the muscles after an attempt at excision, which had been made some time previously.

3. CHOLELITHIASIS. LAPAROTOMY.—This patient, a woman 45 years of age, had previously been in the hospital with enlargement of the liver, irregular fever, occasional sweats, and jaundice of varying intensity. She was thought by the attending physicians to have either abscess of the liver or cancer. She had also a severe cough, and had lost flesh. During the latter part of March or April and the early part of May she had irregular fever. The liver could be felt several inches below the costal border, and on the para-sternal line

there were nine inches of vertical dulness. She had paroxysms of vomiting and abdominal pain, but there is no note whether the jaundice intensified after these attacks. From April 25th to June 6th the weight increased from 105 to 114 pounds. She seemed to have a good deal of cough, and had the gas treatment for many weeks. She returned to the hospital on account of attacks of pain in the back and right hypochondrium, with vomiting. To the right of the middle line, in the epigastric region, there was a firm, solid, resisting mass, continuous with the liver, and descending with respiration. Early in January she had an attack of abdominal pain, chills, fever, and sweat, and then became distinctly jaundiced. On the 8th the prominence at the margin of the liver was very marked. On the 18th she began to have abdominal pain, which was so severe as to call for morphia. On the 19th she had a chill in which the temperature rose to 103.4°. On the 22d she had another chill. The jaundice had become decidedly deeper.

In consultation it was decided to perform an exploratory laparotomy, a diagnosis of obstruction of the gall duct having been made. A free abdominal incision made along the line of the costal cartilages and enlarged by a shorter vertical cut, permitted careful examination of a large area. The gall-bladder was normal in size and consistence. The cystic and hepatic ducts could be plainly felt, and the common duct traced inward into a mass of adherent intestine and omentum where it could no longer be clearly followed. There was diminished mobility of both liver and intestines from prior adhesions. Extensive perihepatitis was present. The right lobe was greatly enlarged and hardened. Free oozing took place whenever the surface of the liver was touched, however gently. The wound was closed. The patient had no shock whatever, and six hours later her t mperature and pulse were normal, but the following day there was a rapid rise of temperature, such as she had previously been having at short intervals, and great increase of jaundice. She died on the succeeding day.

Remarks.—An autopsy revealed a small stone at the extreme orifice of the common duct (which was much lengthened), lying just beneath the mucous membrane of the duodenum, and situated not less than ten inches from the wound at the level of the surface of the abdomen. An hour's careful dissection was necessary to disengage the duct from adhesion to the surrounding structures. The stone could not be forced into the bowel, nor backward further than the point of origin of the ductus choledochus, It could not have been reached without the introduction of the whole hand into the abdominal cavity, and if it had been found could hardly have been dealt with in an operative way, except by lithotripsy through the walls of the duct by means of padded forceps. It is evident that no permanent benefit could have resulted. The wound was in good condition at the time of the autopsy; no hemorrhage had occurred; the general peritoneal cavity was entirely free from exudation or inflammation. There was a localized peritonitis over the hepatic region. The liver was cirrhotic and contained a half-dozen cicatrices of gummata. The kidneys were enlarged and hard.

The case well illustrates a point made by Mr. Morris, viz., the possible existence of a stone beyond the reach of the operator, as well as the teaching of Mr. Thornton as to the increased difficulty of such operations as compared with those in which the stone is readily found in the cystic duct.

4. A LARGE LYMPHOMA OF THE NECK.—S. T., a female 33 years of age, was admitted to the hospital with a very considerable enlargement of the cervical lymphatic glands on the left side, which gave her considerable uneasiness, not only by reason of the deformity, which was very great, but by the embarrassment of movement, by impeding the respiration, and by the constant sense of fatigue from pressure on and displacement of the muscles. As

the growth was increasing, and with it all the symptoms, operation was decided upon. A long incision was made from the mastoid process nearly to the supra-sternal notch, the flaps turned back, the external jugular vein divided between two ligatures and the mass of enlarged glands exposed. They were found adherent to the internal jugular vein with such firmness that it could not be separated by the fingers, and a careful and minute dissection was necessary to free it. This was successfully accomplished and after the ligation of a few venous and arterial trunks the whole growth was removed. Cat-gut drainage was employed and the flaps united rapidly and satisfactorily.

Remarks.—A cardinal rule in removing growths of this character, and, indeed, in the extirpation of all growths of the neck, is one which has been laid down many years ago by Dr. Agnew in his clinical lectures to the University class, namely, thoroughly and completely to expose the tumor and then to work directly upon its surface, completely dividing all the structures, muscular or fascial, external to its capsule. If these two essential points be borne in mind, if the tumor is first freed at a point where its relations are least important, if the deeper dissections are carried on as far as possible with a blunt director or with the fingers, and if the knife when used is kept turned as much as possible toward the surface of the tumor, many formidable growths may be removed with comparative ease and safety.

The description of the above case would apply almost without the change of a word to another upon which I have recently operated except that the growth, which occurred in a boy 5 years of age, was both relatively and absolutely larger. In this case also there were adhesions to the internal jugular, which, as Mr. Holmes has pointed out, is the vessel most likely to be involved. I was fortunate in both cases in being able to remove the growth without injury to this vessel, but would not hesitate to divide it between two ligatures, if any portion of it were found hopelessly adherent or actually incorporated with the tumor.

5. THE RADICAL CURE OF FEMORAL HERNIA.—The operation for the radical cure of femoral hernia was performed by me in two instances. In the first, a female 63 years of age, strangulation existed at the time of operation; the constriction having been divided and the gut, which was in good condition, returned, some adherent omentum was dissected loose and tied off. The sac was encircled with a stout cat-gut ligature as near the femoral ring as possible and was then divided below the ligature, the long ends of which were carried through Gimbernat's ligament on the inside and through the opposite edge of the ring on the outside and then tightly united and cut off. By this means the stump of the sac was made completely to fill and occlude the ring. The fascia and muscles were then brought together, and drainage was provided for by means of cat-gut strands. There was union by first intention without fever. In the second case, a male, the operation was performed on account of frequent irreducibility, accompanied with pain, and alarming symptoms. In this case the sac was folded upon itself and fastened in the internal ring as in Macewen's operation for inguinal hernia, after which the pubic and iliac portions of the fascia lata were brought together in a valvular manner, and the soft parts were closed by interrupted sutures. This case also ran an aseptic course and the cure was complete.

Remarks.—Both of these cases have been fully reported in the UNIVERSITY MEDICAL MAGAZINE for June of this year; and I mention them now chiefly for the purpose of recording the fact that the cure is still perfect in both although the patients have been up and about for months.

6. Excision of the Lower Half of the Ulna for Tubercular Disease.—C. B., 32 years of age, colored, with a history of syphilis eighteen years previously, was admitted to the hospital on account of a hemiplegia supposed to be specific. Later he was transferred from the nervous to the surgical wards with caries of the lower end of the ulna which was thought at first to be syphilitic in character. Erasion of the diseased bone and packing of the cavity having failed to bring about reparative action, the lower end of the ulna with a portion of the shaft was removed by making a longitudinal incision on its posterior surface external to the border of the bone and parallel with its long axis. The muscles were separated with a periosteal elevator; the tendon of the extensor carpi ulnaris was carefully detached from its groove along the lower end of the ulna and pulled to one side and the shaft divided at about the middle; the lower extremity was then separated from its articulation with the radius and the bone removed. The patient did remarkably well for some weeks when he suddenly become stupid, failed in general health, and died with symptoms of profound cerebral pressure. The autopsy showed very widely diffused general tuberculosis, tubercular peritonitis, tubercular disease of the fourth and fifth lumbar vertebræ, and thickening of the spinal meninges with changes in the cord itself. In the left lobe of the cerebellum a tubercular mass, forming a tumor about the size of a hen's egg, was found.

Remarks.—In a general way it may be said that the distinction between syphilitic and tubercular osteitis may be made, if the case is under observation from the first, by observing the following diagnostic points. The syphilitic disease occurs in persons of varying physical condition, usually begins in the periosteum, tends to the formation of new bone or else to the occurrence of necrosis, is often unaccompanied by suppuration, does not involve neighboring articulations, is frequent in the bones of the cranium, and in the majority of cases can be cured or at least arrested if taken in time by judicious specific treatment. The tubercular form of osteitis occurs in persons who have other forms of tubercular disease, begins in the medulla of the bone, tends to disintegration and caries rather than to new formation or necrosis, is usually associated with previous suppuration, is apt to involve neighboring articulations, and is not affected by any form of internal treatment. In this case the autopsy demonstrated that the hemiplegia which was thought to be syphilitic was due to tubercular disease as were all the other symptoms of this patient. The local symptoms alone would not have been sufficient to establish the diagnosis between the two affections.

7. Complete Excision of the Elbow. Union by First Intention. Complete Flexion, Extension, Pronation, and Supination Retained.—C. S., 38 years of age, was admitted to the surgical wards November 12, 1888, with a suppurative arthritis of the elbow-joint and extensive caries of the olecranon and of the articular surfaces of the radius, ulna, and humerus. He had previously undergone excision of the hip for disease of that articulation. A vertical incision was made between three and four inches long, one-third above the tip of the olecranon, and two-thirds below, a little internal to the centre of the joint-line and going right down to the bone, splitting the lower part of the triceps muscle and its tendon. The inner half of the tendon and the soft parts connected therewith, together with the ulnar nerve were then carefully separated from the inner border of the olecranon and the posterior surface of the internal condyle until they could be pushed beyond and a little in front of the epicondyle. The outer half of the triceps tendon was then separated in the same way taking care to retain its connection with the periosteum and deep fascia of the forearm especially at the origin of the anconeus. The joint was then flexed, the lateral ligament divided and the bones protruded through the wound. The ulna was sawn through

just below the coronoid process, a portion of the insertion of the brachialis anticus being retained ; the radius was sawn just below its head and above the insertion of the biceps ; the humerus was divided through the base of the condyles, about one inch being removed. The soft parts were then put in place, the bleeding which was very slight was completely arrested, a rubber drainage tube was placed between the bones and left to project at the middle of the wound, an antiseptic dressing applied and the arm placed upon a right angled anterior splint. The temperature, which before the operation varied from 102 to 103 degrees, sank instantly to normal and remained there. The tube was withdrawn on the fourth day ; there was almost no oozing, the wound united completely by first intention, and the patient was discharged in six weeks having every motion in that joint which he had in the opposite one and capable of supporting with it considerable weight.

Remarks.—In such cases as this the surgeon cannot hesitate about performing excision and the method which was here employed is certainly the best that has yet been devised. There are certain cardinal points during the operation which should never be forgotten. These are avoidance of injury to the ulnar nerve itself, as the most important structure likely to be accidentally damaged by the surgeon ; preservation of the periosteum, and, still more important, of the deep fascia with the attachment of the anconeus upon which the power of extension will largely depend ; the removal of just the right amount of bone as, if too little be taken, there will certainly be anchylosis, and, if too much, a flail-like joint may result. The rule of Mr. Annandale, namely, that an interval of one-and-one-half inches should intervene between the bones after the sections have been made and the bones placed in the position of extension, is a most excellent one, although the surgeon will have to exercise his judgment in each individual case.

8. Rectal Polyp. Removal by Ligation.—This patient, a man 54 years of age, was admitted with the curious history, that two years previously, while an employé of Barnum, one of the elephants had thrust the tip of his trunk into the man's rectum while the latter was in a stooping posture, and that ever since he had suffered from what he supposed to be hemorrhoids. An examination under ether disclosed an unusually large, fleshy, pedunculated polyp, the size of a goose egg, attached to the anterior wall of the rectum some distance above the internal sphincter. It was easily drawn down and ligated tightly close to the mucous membrane and removed. The patient recovered immediately. The case is worthy of record chiefly on account of the unusual size of the growth and the extraordinary history as to its cause, in which the man persisted.

9. Perinephritic Abscess.—G. W., 39 years of age, was admitted to the medical wards in December complaining of loss of appetite, flesh, and strength, pain in the epigastrium, vomiting after meals, etc. His urine was found to contain a large amount of pus and albumen. January 19th he had severe pain in the right side and a slight swelling with induration was noticed just below the last rib posteriorly. This rapidly enlarged and on the 26th he was transferred to the surgical ward. He was at once etherized and a free incision was made parallel to the last rib about one-half inch below it, beginning at the outer edge of the erector spinæ muscle and extending forward for four inches. The skin, the fascia, the anterior fibres of the latissimus dorsi, and the internal and external oblique muscles being divided an enormous abscess was reached which discharged several pints of pus. The perirenal fat had disappeared. The finger inserted into the wound could reach only the lower border of the kidney which was everywhere surrounded by fibrous bands so dense that they were almost cartilaginous. They could not be broken up with any force which could be exerted, and the exploration was therefore very unsatisfactory. The kidney was displaced upward and forward, tightly bound to the abdominal wall and to the

under surface of the liver, and gave the impression of having been much reduced in size. An exploring needle failed to reveal the presence of stone. A drainage tube having been put in place and surrounded by iodoform gauze the patient was returned to the ward. The temperature immediately sank to normal, pus partly disappeared from the urine, the appetite increased, and he appeared to be on road to recovery when at about the end of the tenth day he suddenly died with symptoms of heart-failure. The autopsy showed that the cause of death was an extensive purulent pericarditis. There was some pleuritis on the left side and both pleura and pericardium were tightly adherent to the diaphragm. The left kidney was enlarged and fatty; the right kidney was bound down as above described and could not by any degree of force be separated from its abnormal attachment. No stone could be felt through the much thickened and indurated capsule until, upon breaking up the adhesions between the kidney and liver, the upper anterior surface was exposed, when a large calculus surrounded by an abscess was found partially projecting through the capsule, and imbedded in the liver tissue itself, which was ulcerated and bathed in pus. Careful and repeated attempts to reach this locality through the wound in the loin, the body being placed in the position for operation, showed that it was even then quite impossible to do so. The stone and the abscess about it could not have been approached except by an extensive laparotomy performed through the abdominal wall anteriorly.

Remarks.—A number of cases have been reported in which stones that had been unsuccessfully sought for during life were discovered post mortem, notably one of Mr. Morris's, in which, the kidney having been removed and laid upon the table, it was still impossible by palpation to recognize the existence of a large calculus which was only revealed when the organ was laid open. I have now seen several examples of the displacement of the kidney forward and upward by large perirenal abscesses and desire to call attention to the greatly increased difficulty in both diagnosis and treatment which results from this condition. It would perhaps be well under these circumstances for the surgeon at once to abandon the attempt by means of the lumbar incision, and to perform lateral abdominal section, as in Langenbuch's method of doing a nephrectomy. The kidney may be exposed in this way by opening the external layer of the mesocolon in which the vessels are very scanty. The peritoneal cavity may be shut off from the perirenal space by sewing together the anterior lip of the peritoneal layer of the abdominal wound with the anterior lip of the wound in the mesocolon, after which the kidney may be freely palpated and explored.

10. FECAL FISTULA.—M. E., aged 56, was admitted to the surgical wards December 29th, 1888, presenting three fistulous openings in the abdominal parietes through which feces were being constantly discharged. They had followed a traumatic abscess of the abdominal wall, which had resulted in local peritonitis, intestinal adhesion, and perforation.

On January 12th, 1889, she was etherized, and the sinuses dissected up to their common opening into the gut. The edges of this were freshened and sewed with cat-gut sutures. Cat-gut drainage was provided, and the external wound closed with silk sutures. On the second day after operation fecal matter began to discharge through the dressings. On the 29th the sutures were removed, the union broken up, and the wound packed with iodoform gauze with the idea of producing one fistula, and thereby simplifying the secondary operation.

Remarks.—My experience in the treatment of fecal fistula had taught me that where it is due to a wound, or to a hernia, the chances of spontaneous closure are very good, but it is obvious that in this case the long duration of the disease precluded the idea of cure without operation. I carefully considered

the propriety of performing a formal abdominal section for the purpose of suturing the fistulous opening in the bowel after freshening its edges. Such an operation has been successful in the hands of Mensel, of Gotha, and of others, but I scarcely felt that it was justifiable without at least having first attempted to effect a cure by a less formidable procedure. The case is now one in which it seems probable that a choice must be made between allowing the patient to go without operation, and the performance of an enterroraphy. If she were seriously affected, suffering pain, emaciating, or made miserable by her condition, I would unhesitatingly resort to the latter operation, but as she is exceedingly comfortable, well-nourished, and in such a mental condition that the presence of the fistula does not give her the least distress I still hesitate about the performance of an operation, which, however skilfully done necessarily endangers life in order to relieve a condition which, in this particular instance, is scarcely more than a discomfort.

II. RESECTION OF SPINE FOR FOCAL SPINAL LESION.[1] —A case of focal spinal lesion, kindly referred to me by Dr. Dercum, may be briefly described from the surgical standpoint. When I examined the patient at Dr. Dercum's request, early in October, 1888, I received the following history. His general health was excellent until Christmas, 1887. At about that time he felt shooting pains down the inside of both arms, and eight days later he suffered from loss of power in both lower extremities beginning in the thighs and gradually involving the legs below the knee. During the next four months his symptoms increased in severity, absolute loss of sensation occurring, followed by equally complete loss of power; and more recently by diminished strength of the muscles of the hands and forearms. About June he complained of severe constricting pains beginning about the level of the seventh rib, and gradually rising to a line a little above the nipples. When I saw him he was completely anæsthetic from the toes to the middle of the sternum, was absolutely paraplegic, had incontinence of urine and feces, and was failing in strength and general health. His reflexes were increased, the knee-jerk, ankle clonus, and the plantar reflexes all being readily elicited. In considering the case from a diagnostic stand-point it appeared to me that its history probably excluded ascending or Landry's paralysis; that in sclerosis we should have had a slower and more gradual progress; that myelitis would have been accompanied by symptoms indicative of a more widely distributed lesion, meningitis by greater pain and by no symptoms of localized compression such as the girdle symptom; aneurism also by greater pain, and at that date, probably by evidence of vertebral erosion; caries by deformity and by pain on rude percussion, or upon sudden longitudinal compression of the spine; gumma by a history of syphilis, which was lacking and which had also been excluded by the therapeutic test. There was no history of traumatism which would at any rate have probably resulted in the production of meningitis, myelitis, or caries.

This line of reasoning seemed to render it probable that the case was one of compression of the cord rather than of primary disease of its structures. Having reached this point a further differential diagnosis seemed to me scarcely possible. There was no reason derived from the family or personal history of the patient or from his general condition to suspect either cancer or tubercle. Sarcoma might for the same reason, but with less probability be excluded. It was hoped that a fibroma of the theca might be present and prove to be the efficient cause of the symptoms. In weighing the arguments for and against operative interference the history of previous operations was of course taken carefully into consideration.

The possible dangers seemed to me to be included under the four following heads: First, the disturbance of the cord involved in almost every form of operative procedure, its exact importance being yet practically unknown. Second, hemorrhage from the exter-

[1] This and the succeeding case are more fully reported in the current number of The Annals of Surgery.

nal and internal spinal plexuses of veins. Third, laceration of the membranes, the risk of which accident would of course be increased if they were adherent to the bony walls of the vertebral canal. Fourth, the danger of etherization, much increased by the prone position of the patient and by the paralysis of the abdominal walls. As a matter of fact, however, the operation was easily performed. A longitudinal incision upon the apices of the spinous processes was made, the knife carried down on either side and the erector spinæ masses and the other soft parts were stripped from the laminæ sufficiently to expose the field of operation. The spines were divided at their bases by large bone forceps. The laminæ were then easily divided by successive bites of powerful forceps until they were loosened on either side after which they were separated from the subjacent parts by means of a knife and grooved scissors. The dura was opened for several inches and sutured again with cat-gut. No tumor was found, but there was an inflammatory thickening of the theca, and adhesions between the cord and membranes which were carefully broken up. I may say at once that this method proved entirely satisfactory in both the cases in which I have employed it, and that in neither of them did any of the anticipated accidents occur.

Remarks.—Surgically the subsequent course of the case was uneventful. Free oozing with escape of cerebro-spinal fluid necessitated a daily change of the dressings for several days, after which it was done at much longer intervals. The tube was shortened by drawing it out at the lower angle of the wound on the fifth day, and was withdrawn completely on the tenth day. There was great pain on the second day after the operation, and considerable discomfort for three or four days later, referred to the back and legs. There was almost no fever; with the exception of one day—the 11th—when it suddenly rose to 103°, the temperature never went above 100°. On that occasion it was found to be due to obstinate constipation, and fell permanently after the use of purgatives and quinine. The deep portions of the wound healed in about two weeks. Union was complete in a little more than three weeks.

There were no complications of any sort whatever, and at no time, so far as the operation was concerned, was the patient's condition one that could justify anxiety.

The bed-sore healed promptly, sensation and motion greatly improved, and at the date of this report that improvement is still continuing.

12. Resection of Spine for Pott's Paralysis.—J. G., aged 23, white, was admitted to the surgical wards, with the following history :—

On the 20th of March, 1888, he was admitted to the medical wards, complaining of severe pain in the lumbar region which had lasted for three months. About a week before admission both legs became swollen. Shortly after admission he developed pneumonia. On attempting to leave his bed, in June, 1888, he noticed that he was unable to control his legs. This condition of paraplegia continuing, he was transferred to the surgical wards December 12th, 1888, for operative interference. At the time of admission he presented a marked antero-posterior curvature of the spine, the process of the tenth and eleventh dorsal being the most prominent. All this time there was no elevation of temperature and no indication of active pulmonary disease was discovered by the medical attendants.

On December 12th, 1888, I removed the arches of the 10th and 11th dorsal vertebræ. The patient died thirty-nine hours after the completion of the operation, having lost but little blood, but complaining greatly of pain in the back. He showed an extraordinary variation in the temperature taken simultaneously in the axilla, under the tongue, and in the rectum. For hours the extreme difference was as much as 8° or 9° Fahrenheit, the thermometer constantly showing 95° beneath the tongue, 102.5° in the arm-pit, and 104° to 105° in the bowel. This continued until his death.

Remarks.—It is not necessary to repeat in this case the details of the operative procedure which were precisely the same as in the previous one. The result was a surprise and great disappointment to me. So much less interference with both bony and nervous structures had occurred; the patient was so much younger; his general appearance was so good and his nutrition so excellent that my prognosis, based also on the reports of the attending physicians and neurologists, was very favorable as regarded the immediate effects of the operation. The autopsy disclosed a hopeless condition (enormous encapsulated tubercular spinal abscess and tubercle of lower lobe of right lung), that went far both to explain the fatal result, and to render it less distressing, as the case was evidently a hopeless one. Either the spinal abscess or the pulmonary tubercle would have strongly contraindicated operation had their existence been revealed by persistent fever and sweating, by cough and emaciation, or by physical signs. In the absence, however, of these, and of all other significant symptoms, and in the presence of a spinal deformity which appeared to point strongly to a pressure paraplegia, the operation seemed justifiable.

The immediate cause of death I am disposed to believe was a combination of shock, with the free use of ether in a patient with crippled lung power, degenerated heart-muscle and amyloid kidneys. There was no hemorrhage of any moment, and, indeed, the quantity of ether administered was not excessive as compared with that given in every-day operations on ordinary patients.

The chief lessons of the case are: 1. The apparently unavoidable risk due to insidious and unrecognizable complications—a risk which is probably greatly increased in tuberculous patients. 2. The existence of red softening in Pott's paralysis, a condition which if we can judge by recorded autopsies, and by the expressed opinions of many competent observers is more or less exceptional. 3. The necessity for extreme caution in the use of anæsthetics in all cases in which the existing and recognized disease makes coincident visceral changes probable or even possible.